

Rhodora

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THE NEW ENGLAND BOTANICAL CLUB

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NEW SPECIES OF CLADOPHORA.

F. S. COLLINS.

(Plate 78.)

Cladophora microcladioides n. sp. Frondibus plus minusve caespitosis, 10–20 cm. altis; filamentis basi circa 200 μ diam., rigidis, rectis vel flexuosis, distanter di-trichotomis, ramis similibus, erectis aut plerumque recurvatis, ramulos breviores secundatos latere superiore et interiore gerentibus; ramifications ejusmodi iterata in ramellos ultimos paucicellulares subacuteos, 80–100 μ diam., desinente; cellulis diametro 2–6-plo longioribus; membrana cellulari crassa, in cellulis adultioribus lamellosa. Ramis fere e cellulis omnibus ortis, singulis, vel ad quatuor e cellula singula.

Fronds more or less tufted, 10–20 cm. high; filaments about 200 μ diam. at the base, stiff, erect or flexuous, distantly di-trichotomous; branches similar, erect or more generally recurved, bearing shorter ramuli, secund on the upper or interior side; repeated ramification of this kind ending in few-celled subacute ultimate ramelli, 80–100 μ diam.; cells 2–6 diam. long; cell wall thick, in older cells lamellose. Branches arising from almost every cell, singly, or up to four from one cell.—Coast of California, from Monterey to San Pedro.

A stout but graceful species, with a characteristic ramification, like that of the red alga, *Microcladia borealis* Ruprecht. There is considerable variation according as the main divisions are straight or flexuous, the branches close or more distant, erect or recurved; but the peculiar symmetrical ramification will distinguish it from any other of the American species. In the most typical form, every branch is regularly recurved, and bears on its convex side a series of similar but smaller branches, which curve uniformly in the opposite direction; and in turn bear another similar series. In some plants the branching is very dense, two, three or even four branches issuing from the top

of a single cell, which may be twice as broad at the top as below; usually all but one of these branches are short and simple or nearly so; one being longer, and developing in the typical way. However many branches may issue from one cell, they are never whorled, but expand flabellately in one plane. In the writer's herbarium are specimens from Monterey, collected by Prof. G. J. Pierce, and from San Pedro, collected by Miss S. P. Monks and by Dr. N. L. Gardner; the specimens from the last are in the best condition, and should be considered the type.

C. Howei n. sp. Filamentis repentibus vel decumbentibus, caespites densos formantibus; cellulis irregularibus, circa $150\ \mu$ diam., in cellula terminali ad $75\ \mu$ attenuatis; longitudine diametron aequante vel triplo superante; filamentis erectis, basi circa $50\ \mu$ diam., ad 20 – $25\ \mu$ diam. in apice rotundato vel subacuto attenuatis, e filamentis basilaribus excurrentibus, cellulis basi diametro 5–6-plo prope apicem ad 15–20-plo longioribus; filamentis erectis parce ramosis, ramis erectis vel adpressis, filamentis erectis similibus.

Filaments creeping or decumbent, forming dense tufts; cells irregular, about $150\ \mu$ diam., diminishing to $75\ \mu$ in the terminal cell, one to three diam. long; vertical filaments, about $50\ \mu$ diam. at the base, diminishing to 20 – $25\ \mu$ at the rounded or slightly acute apex, issuing from the basal filaments; cells 5–6 diam. long at the base, 15–20 at the tip; vertical filaments sparingly branched, branches erect or appressed, similar to the vertical filaments.—Gibbet Island, Bermuda, June, 1900, collected by Dr. M. A. Howe, No. 33. Type material in the herbarium of the writer and that of the New York Botanical Garden.

Forming a dense coating in tide pools, about 1 cm. high; the base a dense mass of dark green, much branched, irregular filaments, from which arise the slender, slightly branched, long-jointed filaments, pale green under the microscope, yellow in the mass. This yellow may not be a permanent character, as the same shade appears to be produced by local conditions in some algae normally green. The contorted, densely matted basal filaments suggest the subgenus *Aegagropila*, but there is no indication of a definite form to the whole mass. The sharp distinction between the delicate, erect filaments and the stout, thick-walled basal growth, reminds one of certain fresh water species of *Cladophora*, in which cells, often remaining connected in filaments, pass the winter in a thick-walled, akinete state, emitting new and quite different appearing filaments in the spring. But in *C. Howei* the stouter cells do not seem like akinetes, and appear to continue to

grow and divide, the terminal cells being considerably more slender than the others, but much larger than those of the erect filaments.

C. graminea n. sp. Frondibus caespites laxos formantibus, 10–15 cm. longis, cartilagineis, prasinis; filamentis primariis 300 μ diam., distanter di-trichotomis; ramis omnibus erectis, ramulis ultimis 100–150 μ diam., apicibus obtusis vel subacutis; cellulis inferioribus praelongis, ad 30-plo longioribus quam crassis; superioribus brevioribus, eis ramorum ultimorum diametro 4–6-plo solum longioribus; cellula singula normaliter spatium inter dichotomias proximas occupanti; membrana cellulari plerumque valde striata.

Fronds forming loose tufts, 10–15 cm. long, cartilaginous, dark green; main filaments 300 μ diam., distantly di-trichotomous; all divisions erect, ultimate divisions 100–150 μ diam., tips blunt or slightly acute; cells very long, up to 30 diam. below, shorter above, in the ultimate branches 4–6 diam., each cell normally occupying the space between two successive forkings; cell wall usually strongly striate.—Monterey to San Pedro, California.

Distinguished from all our other species by the long cells, each normally extending from one forking to the next; in this it agrees with *C. pellucida* (Huds.) Kütz. of Europe, but in the latter there is more reduction of size in the successive orders of branches, the main filament being sometimes as large as 500 μ diam., while the ultimate ramuli are seldom over 50 μ , and are dense and more or less fasciculate. In *C. graminea* there is comparatively little diminution in size, and the tips are loose and open. In *C. pellucida* the divisions of the di- or trichotomy are usually equal and develop equally; in *C. graminea* one is often much reduced, sometimes being only a single cell. The original specimen was sent the writer by Mrs. A. E. Bush, under the name of *C. cartilaginea* (Rupr.) Harvey, and there is a certain similarity of habit; but Ruprecht's *Conferva cartilaginea* is not a true *Cladophora*, and probably should be placed in *Spongomorpha*. Mrs. Bush's specimen, in herb. F. S. C., is the type of *C. graminea*.

C. constricta n. sp. Fronde dense caespitosa, ad 10 cm. alta, subfastigiata; filamentis primariis ad 65 μ diam., ramis minoribus, ramulis ultimis circa 25 μ diam.; cellulis diametro 5–20-plo longioribus, plerumque leviter clavatis, frequenter constrictionem annularem distinctam paulo super basin exhibentibus. Ramificatione plerumque opposita inferne et saepe superne, saepe etiam laterali, ramulis brevibus subsecundatis; ramis et ramulis primo subpatentibus, mox sursum curvatis; apice cellulae terminalis breviter conicali-rotundata.

Frond densely tufted, up to 10 cm. high, somewhat fastigiate; main filaments to 65 μ diam.: branches smaller, ultimate ramuli about

25 μ ; cells 5–20 diam. long, mostly somewhat clavate; often with a distinct annular constriction shortly above the lower end; branching mostly opposite below and often above, but also often lateral, the short ramuli somewhat secund; branches and ramuli at first rather patent, soon curving upward; apex of terminal cell shortly conical with rounded tip.—Montego Bay, Jamaica, June 12, 1907. Collected by Dr. M. A. Howe, in connection with the expedition of the New York Botanical Garden to Jamaica. No. 4978. Type material in herb. F. S. C. and herb. N. Y. B. G.

In general appearance this species reminds one of a small and dense form of *C. gracilis* such as is often found in shallow pools on the north Atlantic coast, but the resemblance is merely external, the branching being more like that of *C. rupestris*, from which, however, it differs much in dimensions and texture. The cells vary in length, but average quite long, and usually increase slightly in diameter from the base to the summit. In the older parts the branching is quite regularly opposite, and as the basal cells of each branch are of the same size as the cell of the main filament arising between them, the effect is that of trichotomy. In a few cases four practically similar cells have been seen arising from the same point. As a branch or a pair of branches arises from about every second cell of a filament, the frond becomes very dense, and as the development seems to go on quite uniformly throughout the frond, the outline is usually regular. The constriction does not occur on all the cells, and may be more or less prominent; often it is very distinct, the diameter of the cell being reduced at this point to less than half the normal, the interior thickening of the cell wall contributing to the reduction. This constriction is interesting as showing a possible relation to the *Valoniaceae*, in which the character is sometimes strongly developed.

MALDEN, MASSACHUSETTS.

EXPLANATION OF PLATE 78.

- Fig. 1, *Cladophora Howeii*, portion of basal filament with erect branches.
Fig. 2, " *microcladioides*, portion of densely branching frond.
Fig. 3, " " general scheme of branching.
Fig. 4, " *constricta*, trichotomy in a main branch.
Fig. 5, " " main branch, outline only.
Fig. 6, " *graminea*, end of branch, outline only.

NOTES FROM SHELBOURNE, NEW HAMPSHIRE.

WALTER DEANE.

I have spent portions of many seasons in Shelburne, New Hampshire, a town of some three hundred inhabitants, lying on both sides of the Androscoggin River. The valley is about 210 meters above sea level and the flora is characteristic of northern New Hampshire, but a record of a few plants found there may prove of interest. The two pines of the region are *Pinus Strobus* L. and *Pinus resinosa* Ait., the former of wider distribution. In the summer of 1881 I discovered a fine specimen of *Pinus rigida* Mill. on a wooded slope about 35 or 40 meters above the intavale on the farm of Mr. A. E. Philbrook. Under date of February 8, 1909, Mr. Philbrook writes: "The Pitch Pine you found in 1881 is sixty feet tall and thirteen inches in diameter, is in good condition and has cones. Two small ones have come up near by that are about twenty feet high and three or four inches in diameter." Dr. A. S. Pease and Mr. A. H. Moore, who have been working very systematically for a number of years on the flora of Coos County, which includes the town of Shelburne, have been unable thus far to detect any more Pitch Pine in their limits. It was, therefore, with added interest that I was shown in October, 1908, two additional trees in Shelburne. On October 18, Professor Ephraim Emerton, who has a summer home adjoining the Philbrook Farm, showed me on the plateau near his house a vigorous Pitch Pine about 5 meters high and fully 1.5 decimeters through 12 decimeters above the ground. It was growing naturally in a grove of White and Red Pines and it may have been a seedling from the one previously mentioned from which it is about 4 hectometers distant, or perhaps from the third specimen which is on a wooded slope about midway between the two.

This last tree was shown me on October 25 by Mr. Philbrook on whose farm it grows, but a few minutes' walk from the tree of 1881. This pine is about 18 meters high, 5 decimeters through at the butt, and 4 decimeters through some 12 or 15 decimeters above the ground. It is a fine straight specimen full of cones, but leafy only near the top owing to its close proximity to the surrounding trees. No seedlings were discovered.

Another interesting find for Coos County is *Juniperus communis* —

L., var. *depressa* Pursh. On April 23, 1908, Mr. Philbrook discovered a specimen of this shrub in a patch of open woods adjoining his farm about 20 meters above the intvale. The plant was about 3 meters in diameter and was full of fruit. Mr. Philbrook sent me a specimen at the time, and later I visited the place and secured additional material. On October 13, but a few minutes' walk from this Juniper and in the same open wood, a second specimen was discovered by a party of us who were out for a tramp. It was a little smaller than the first one but bore fruit. These two Junipers and three Pitch Pines constitute at present the only known records for Coos County though, considering the known range of the two species and the fact that there are plenty of situations congenial to them, it seems hardly possible that additional ones should not be found.

On May 29, 1908, I discovered *Camelina microcarpa* Andrz. in a grassy field in Shelburne, and on July 14, 1908, I found by the railroad station the same species, together with *Erysimum cheiranthoides* L. and *Sisymbrium altissimum* L., all in close proximity and in flourishing condition. These introductions are now quite widely spread over New England.

Pentstemon laevigatus Ait. appeared in Shelburne in June, 1908. It was discovered by Miss Louise Davenport in the intvale of the Philbrook Farm, growing among the short grass, some 300 meters from the house. There were at least eight plants covering an extent of about one fifth of a hectare, each specimen about 30 meters from its nearest neighbors. The plants were all in good flower though the soil, owing to the extreme drought, was very dry. I visited the place on July 3 and examined the location. I have in my herbarium specimens of all these herbaceous species.

CAMBRIDGE, MASSACHUSETTS.

NOTES ON MONOSTROMA.

F. S. COLLINS.

THE genus *Monostroma*, as proposed by Thuret,¹ included only those species of the older genus *Ulva* that had a single layer of cells, quasi-independently located in a gelatinous membrane. Those forms with a single layer of cells, arranged parenchymatously, the same as the double layer in *Ulva*, in the restricted sense, were included in *Enteromorpha*. Under the name of *Enteromorpha Grevillei* Thuret included *Ulva Lactuca* Agardh,² and the species of the same name of Greyville,³ neither of these being the *U. Lactuca* Linnaeus.⁴ Le Jolis,⁵ extends the genus *Ulva* to include *Enteromorpha*, and the species in question appears as *U. Grevillei* (Thur.) LeJolis. Wittrock,⁶ gave the genus *Monostroma* the extension that it has since held; to include all the *Ulvaceae* with a single layer of cells, arranged as a membrane, whatever the texture of the latter. The species in question here appears as *Monostroma Grevillei* (Thur.) Wittrock. Both Le Jolis and Wittrock gave the references to Agardh and Greville in the synonymy. J. G. Agardh⁷ appears to have been the first to point out that it was by no means certain that the plants mentioned by the elder Agardh and by Greville were identical, and though he gave the distinctions with considerable detail, his views do not appear to have been accepted by later writers. That there are two forms, quite distinct in their typical appearance, though possibly intermediate forms may be found, seems to the present writer to be the fact. Both occur on the New England coast, and both have been distributed in the *Phycotheca Boreali-Americana*; *M. Grevillei* as No. 15, *M. Lactuca* as No. 1271. Both are at first saccate, but the sac in *M. Grevillei* is nearly globular, in *M. Lactuca* more elongate; in the former species it soon splits into broad segments of irregular shape; in the latter into long, sublinear laciniae, often with a stipe-like base; these laciniae

¹ Note sur la synonymie des *Ulva Lactuca* et *latissima* L., etc. Mém. Soc. Sci. Nat. de Cherbourg, Vol. II, p. 29, 1854.

² Sp. Alg., Vol. I, p. 409, 1822.

³ Algae Britannicae, p. 172, 1830.

⁴ Sp. Plantarum, Vol. II, p. 1163, 1753.

⁵ Liste des algues marines de Cherbourg, p. 37, 1863.

⁶ Forsök till en monographi over alglägetet *Monostroma*, 1866.

⁷ Till Algernes Systematik, VI, *Ulvaceae*, Lunds Univ. Arsskrift, Vol. XIX, p. 101, 1882.

may be simple or forked, and usually have the edges crisped; when they are simple, there is quite a resemblance to a clump of individuals of *Enteromorpha Linza* (L.) J. Ag.; when forked, the resemblance is equally marked to *Ulva fasciata* Delile; the laciniae are sometimes quite palmately arranged. The frond of *M. Lactuca* is somewhat thicker; 20–25 μ , as against 15–20 μ in *M. Grevillei*; the structure of the former is more distinctly parenchymatous, and the texture less soft and lubricous. In a cross section of a vegetative frond the cells show much alike, horizontally elongate, occupying about two thirds of the thickness of the frond.

In Wittrock's monograph, Plate IV, fig. 14, c, represents a fruiting frond, with the characters of *M. Lactuca*; in *M. Grevillei*, as observed by the writer, the fertile portion of the frond puts on quite a different appearance; the membrane becomes thicker and more gelatinous, the cells elongate vertically to the surface of the frond, finally assuming the palisade form characteristic of *M. fuscum*, though on a smaller scale; as the spores are discharged, the membrane melts away, and there is nothing of the persistent empty tissue, shown in *M. Lactuca*, which was the principal character for the exclusion of the species from *Monostroma* by Thuret and Le Jolis. The writer does not claim the original discovery of this form of spore production; it has been noted by Rosenvinge¹ but he thinks that this is the first suggestion that it may be a distinguishing character between the two species. Specimens in this fruiting condition have been distributed as P. B.-A., No. 1467.

The question of how far related forms, evidently closely connected, are to be distinguished as species, will probably always be a matter of discussion; so much depends on the way of looking at the matter. Jónsson,² refers to the writer's arrangement of *M. Grevillei* and allied forms,³ as follows:—“I cannot admit Collins to be right in dividing *M. Grevillei* K. Rosenv. into two species: *M. Grevillei* Collins including var. *Vahlii* K. Rosenv., and *M. arcticum* Collins including var. *intestiniformis* K. Rosenv. The limit between the two species as understood by Collins, is as indistinct as the limit between the main form of the species and the included varieties. If closely related forms, which run into each other, are not to be regarded as belonging to one

¹ Grønlands Havalger, Meddelelser om Grønland, Vol. III, p. 948.

² The marine algae of East Greenland, Meddelelser om Grønland, Vol. XXX, p. 65.

³ The Ulvaceae of North America, RHODORA, Vol. V, p. 13.

and the same species, we had better take as a species every form that can be described plainly enough to be recognizable, than form species of artificially grouped forms." While this last suggestion goes too far, something near it may be temporarily admissible until we have a life history of each species, from the spore on. In the meantime it is almost as hard to draw sharp lines between *M. undulatum* Wittr., *M. pulchrum* Farlow and *M. Grevillei*, as they occur on the American coast, as it is between *M. Grevillei* and *M. arcticum*, as we understand them; for the sake of clearness it has seemed better to the writer to make more specific distinctions than Rosenvinge found expedient; in the matter of *M. Grevillei* and *M. Lactuca*, it is hoped that the new character, in the fertile frond, will render this distinction more acceptable. As this very distinct form of the fertile cell really amounts to the formation of a specialized sporangium, it would seem to place this species at the head of the genus.

At page 63 of Jónsson's work, he refers again to the writer's paper on the *Ulvaceae*, calling attention to Rosenvinge's note¹ that the cells of *M. fuscum* (Post. & Rupr.) Wittr. contain two chromatophores, one at each end; adding as a footnote, "F. S. Collins (The *Ulvaceae* etc.) does not at all mention this important character neither in the description of the species nor in the description of the genus *Monostroma*." The writer has since made a careful examination of fresh material, collected at Revere Beach, Massachusetts, the locality at which were collected the specimens distributed as *Phyk. Univ.*, No. 64, and *P. B.-A.*, No. 715. In every instance a single chromatophore was found in a cell. It is, of course, possible that the Greenland plant is different from the plant of the New England coast, but this is hardly likely, as the figure in Wittrock, l. c., Pl. III, fig. 11, shows a perfectly uniform chromatophore, quite like the Revere Beach plant; and this was drawn from a specimen collected in Norway. A more probable explanation is suggested by the fact that in dried specimens of green algae the contents of the cells shrink, and the remains of the chromatophores tend towards the ends, leaving the middle apparently empty; this is very conspicuous in plants with large cells, like *Chaetomorpha Melagonium* (Web. & Mohr) Kützing.

M. orbiculatum Thuret,² was not mentioned in the writer's paper on *Ulvaceae*, previously referred to, but what appears to be this species

¹ Grønlands Havalger, Meddelelser om Grønland, Vol. III, p. 940.

² Mém. Soc. Sci. Nat. de Cherbourg, Vol. II, p. 388, 1854.

occurs at Bermuda,¹ and on the Pacific coast near San Francisco, W. A. Setchell. It has fronds of a general orbicular outline, but more or less cleft and usually considerably plicate; the frond 30–40 μ thick, parenchymatous in structure, the cells angular, of irregular form, the chromatophore similar in shape but considerably smaller; cells in cross section rounded, generally vertically elongate, 25–30 μ high, the chromatophore occupying the middle part of the cell. The frond is at first attached by fibrillar prolongations from the lower cells, but soon becomes free, and floats in quiet salt and brackish waters, the same as *M. latissimum*. The texture appears to be firmer and the substance less gelatinous than in *M. latissimum*, and the dried specimen does not adhere very well to paper.

In July, 1907, the writer found at Eastham, Massachusetts, along the shore of the "Salt Pond," the expanded upper end of a long creek among the salt marshes, a plant which at first he supposed to be a new species, but which on the whole may better be included under *M. orbiculatum*. It formed rounded rosette-like masses on the mud just above low water mark; attached by the center, a single individual being as much as 25 or 30 cm. in diameter of expansion. The folds in the frond were so abundantly developed that the appearance was that of a clump of many individuals, but in each case it proved to be one plant. In appearance, the cells were like those of typical *M. orbiculatum*, but in cross section the thickness of the frond ranged from 60 μ in the lower part, to 16 μ near the margin, and the cells throughout showed either a circular or a horizontally elongate section. Quite an area of the under side in the center of the frond was furnished with the fibrillar growths from the cells, which were here larger and of more irregular shape than in the rest of the frond. It may be characterized as follows:—

M. ORBICULATUM forma *varians* n. f. Fronde eximie plicata, substrato diu affixa; in sectione transversali 50–60 μ crassa basin versus, prope marginem tenui, 16–20 μ ; cellulis in sectione plus minusve horizontaliter elongatis.

Frond extremely plicate, remaining long attached to the substratum; in cross section 50–60 μ thick near the base, thin near the margin, 16–20 μ ; cells more or less horizontally elongate in cross section.—Eastham, Massachusetts, near low water on muddy shore of marsh creek.

MALDEN, MASSACHUSETTS.

¹ Farlow in Farl. And. & Eaton, Alg. Am.-Bor. Exsicc., No. 173.

THE WINTER MEETING OF THE VERMONT BOTANICAL CLUB.

NELLIE F. FLYNN.

THE fourteenth annual meeting of the Vermont Botanical Club was held at Middlebury, January 21–23, 1909, in conjunction with the Vermont Bird Club and the New England Federation of Natural History Societies. The joint programme was diverse and full of highly interesting features. Only the botanical papers can be mentioned here and these briefly.

Dr. Brainerd of Middlebury spoke of fifteen hybrids possible in a group of six related *Aspidiums*. Most of these hybrids have already been found, many of them in Vermont.

Mr. W. H. Blanchard of Westminster discussed many new species and forms of *Rubus*. The fact was pointed out that no less than sixteen of these are included in the new edition of Gray's Manual.

Prof. L. R. Jones of the University of Vermont spoke of the grasses, especially of the genera *Agropyron*, *Agrostis*, and *Panicum*, and showed the changes of classification and nomenclature of these groups as treated in the new Gray's Manual and in the revised Flora of Vermont now in preparation.

Mr. W. W. Eggleston of Washington, D. C., discussed from the same point of view some difficult genera of the Rose Family, especially *Amelanchier*, the Shad Bushes.

Misses A. L. Carpenter and Mary Robinson, of the University of Vermont, presented a revised list of Vermont ferns, classified according to the new Manual, with the result that no less than six species, varieties, and forms are added to the old list.

Mr. Rufus Crane of Middlebury College read an interesting paper on "Hybrid Baneberries" and exhibited specimens of the red and white baneberries and of some anomalous intermediate forms. These were mentioned by Dr. Gray forty years ago, but only one is described in the new edition of Gray's Manual. Mr. Crane and Dr. Brainerd have recently found evidence that these forms are probable hybrids, which follow Mendel's law. In the hybrids the red color dominates over the white, and the seeds are reduced in number, indicating a loss of fertility.

Mr. J. E. Crane of Middlebury spoke interestingly of the different plants from which bees gather honey. The number was larger than is generally supposed. Samples of the honey made from the flowers of basswood, raspberry, alfalfa, and buckwheat were shown, and it was stated the raspberry honey took the highest prize at the Jamestown Exposition.

Miss Carrie W. Ormsbee of Brandon read a carefully prepared paper on "Forestry and Water Supply."

Mrs. D. C. Webster of Hartland gave a report of the orchids thus far found in that town. They number thirty-five.

Miss Nancy Darling described and exhibited in mounted specimens a number of the rarer plants of the Eshqua Bogs in Hartland.

Prof. A. J. Grout presented a paper on "Nature study in the Public Schools."

Mrs. E. B. Davenport of Brattleboro read a paper showing that the copious gathering of ferns for florists was becoming a serious menace to our native fern flora.

Mr. George L. Kirk of Rutland told of a new station, near that city, for the Chain Fern, *Woodwardia virginica* (L.) Sm. No less than two or three hundred plants were found. They were in groups upon a typical sphagnum bog. With them grew large quantities of *Osmunda cinnamomea* L., of which much was of the var. *incisa* J. W. Huntington. It was stated that specimens of this variety had been sent to the Gray Herbarium and were reported the first ever received from Vermont.

Mrs. Carrie E. Straw of Stowe reported an addition to the flora of Vermont in *Eruca sativa* L.

Miss Alice E. Bacon of Bradford gave some additional evidence as to the poisonous qualities of the Showy Lady's Slipper.

Mr. N. J. Giddings of the University of Vermont described the lifting power of a fungus growing under a tar-concrete walk, its lifting strength being estimated at two tons.

Many shorter papers on many topics were presented, and an account of the summer meeting on Mt. Mansfield was given by Mrs. Nellie F. Flynn of Burlington.

Officers of the Club were elected as follows: Pres., Ezra Brainerd, Middlebury. Vice-pres., C. G. Pringle, Burlington. Sec., Prof. L. R. Jones, Burlington. Treas., Mrs. Nellie F. Flynn, Burlington. Librarian, Miss Phoebe M. Towle, Burlington. Executive Committee,

D. S. Carpenter of Middletown Springs, Mrs. E. B. Davenport, Brattleboro, and Miss Nancy Darling, Woodstock. Committee to determine the time and place of the summer meeting, Dr. H. H. Swift, Pittsford, Mr. W. W. Eggleston, Washington, D. C., and Prof. L. R. Jones, Burlington.

It is probable that the summer meeting will be held at some point on Lake Champlain, during the week of the ter-centennial celebration of the discovery of the Lake, probably July 6 and 7.

BURLINGTON, VERMONT.

TUBERS ON THE ROOTS OF *ELEOCHARIS INTERSTINCTA* AND *E. QUADRANGULATA*.—One afternoon last October the writer, in company with Prof. M. L. Fernald, dug some specimens of *Eleocharis interstincta* and *E. quadrangulata* in Waban Lake, Wellesley, Massachusetts. On the roots of *E. quadrangulata* elliptical or oblong, pale, tuber-like growths were found varying in length from 2–8 mm. They were situated on the finer branches of the root at some distance back of the tip, but the portion of the root beyond the tuber had disappeared in all but the younger examples. The frequency of the occurrence was variable, some plants apparently bearing none, others several. Sections through all parts of the tuber showed the presence of the regular root-structure,—a central vascular cylinder, and a cortex which in this case was very much thickened and gorged with starch. On the same plant with fresh tubers, older tubers were found on older roots. These consisted of a shell-like outer covering, and the woody central cylinder, but were otherwise hollow, thus suggesting that the starchy material had been removed for use. The tubers of *E. interstincta* were similar in every respect.

It was first thought that the tubers were of the nature of galls, but no evidence was found to support this view. It would be interesting to know if similar tubers are found on these two species in other localities farther southward, and if there is any evidence that they are not true tuberous roots. The writer has been unable to find reference to the occurrence of such growths on the roots of any species of *Eleocharis* though similar ones are known to occur in *Cyperus*.—K. M. WIEGAND, Wellesley College.

CERTAIN RAILROAD WEEDS OF NORTHERN NEW HAMPSHIRE.—On 24 August, 1908, while making a trip over the Baldcap Range from Shelburne into the township of Success, New Hampshire, Mr. A. H. Moore and the writer discovered, in the latter township, on the gravelly bed of an abandoned lumber-railroad, a flourishing colony of *Gnaphalium sylvaticum* L. The railroad has not been used for years, and this locality, itself on a branch line, is some miles from any settlement, the nearest at present being Berlin, five or six miles distant.

Various plants of interest have appeared along the Grand Trunk Railroad in northern New Hampshire. Most prominent is *Euphorbia hirsuta* Wiegand, which has formed large mats along the track in Berlin and Gorham, and in September is very conspicuous from the orange color of its stems and foliage. *Ambrosia psilostachya* DC. grows along the Grand Trunk near Berlin, and there are two clumps of *Artemisia ludoviciana* Nutt. along the Boston and Maine tracks in the same town. *Euphorbia Helioscopia* L., *Chenopodium glaucum* L., and *Salsola Kali* L., var. *tenuifolia* G. F. W. Mey. are also of local occurrence in Berlin. *Polygonella articulata* (L.) Meisn. may be traced along the Maine Central up through Crawford Notch to Crawford's, where it appears sporadically, and still farther north, on the Boston and Maine, near Appalachia Station in Randolph, it is thoroughly and abundantly established. Specimens of these plants are preserved in the writer's herbarium.—ARTHUR STANLEY PEASE, Cambridge, Massachusetts.

ADDITIONAL NOTES ON PLANTS OF CHESTERVILLE, MAINE.—The most noteworthy plants found in this vicinity during the summer of 1908 were discovered in the month of June by Miss F. J. Keyes and were as follows.

Habenaria bracteata (Willd.) R. Br., in a swamp on Zion's Hill, near North Chesterville.

Arethusa bulbosa L., in a bog bordering on Lock's Pond, near North Chesterville. According to the present knowledge of the writer, this is the second station, both in Chesterville and Franklin Co., for this interesting little citizen, *Arethusa*, while it also extends its range a few miles farther north.

The first mentioned find, *Habenaria bracteata* R. Br. with *Habenaria*

Andrewsii White, for which the new Manual gives South Chesterville as one of its two stations, the other being Pownal, Vt., swells the list of Chesterville orchids to twenty-nine — not a bad showing for one small town.— LILLIAN O. EATON, Mt. Vernon, Maine.

A PUBESCENT VARIETY OF ASTER DUMOSUS.— In a large collection of Michigan plants collected the past year by Mr. C. K. Dodge there is an Aster of unusual interest. The plant, which is stated by Mr. Dodge to be "very common on Hersen Island and all islands formed by the mouths of the St. Clair River, in damp and marshy ground," is superficially like *Aster dumosus* L., var. *strictior* T. & G. In fact it would at first sight pass as a good match for one of the original sheets of var. *strictior* collected by Pitcher at Fort Gratiot, Michigan, and later material from Sandwich, Ontario. The var. *strictior*, however, like the other described variations of *A. dumosus*, is an essentially glabrous plant, while the characteristic plant from the islands at the mouth of the St. Clair River has its stem and to some extent its leaves cinereous with very dense short harsh pubescence. In this character the plant is comparable with *A. paniculatus* Lam., var. *cinerascens* Fernald. The plant from Michigan may be designated.

ASTER DUMOSUS L., var. **Dodgei**, n. var., omnino ut var. *strictior* sed caule dense scabro-puberulo, pilis cinereis; foliis scabris puberulis. — MICHIGAN, in damp and marshy ground on Hersen Island and other islands at the mouth of the St. Clair River, St. Clair County, September 17, 1908 (C. K. Dodge, nos. 84, 85).— M. L. FERNALD, Gray Herbarium.

A JUNCUS NEW TO NEW ENGLAND.— On 16 August, 1907, while climbing Table Rock at Dixville Notch, New Hampshire, I collected on the talus slopes a specimen of what I at the time supposed to be *Juncus trifidus* L. Upon comparison, however, with specimens at the Gray Herbarium, it appeared to be *Juncus trifidus* L., var. *monanthos* (Jacq.) Bluff & Fingerhuth, a variety not reported in the seventh edition of Gray's Manual as occurring north of southern New York. Its presence at Dixville indicates that it should be searched for at other points in New England.— ARTHUR STANLEY PEASE, Cambridge, Massachusetts.

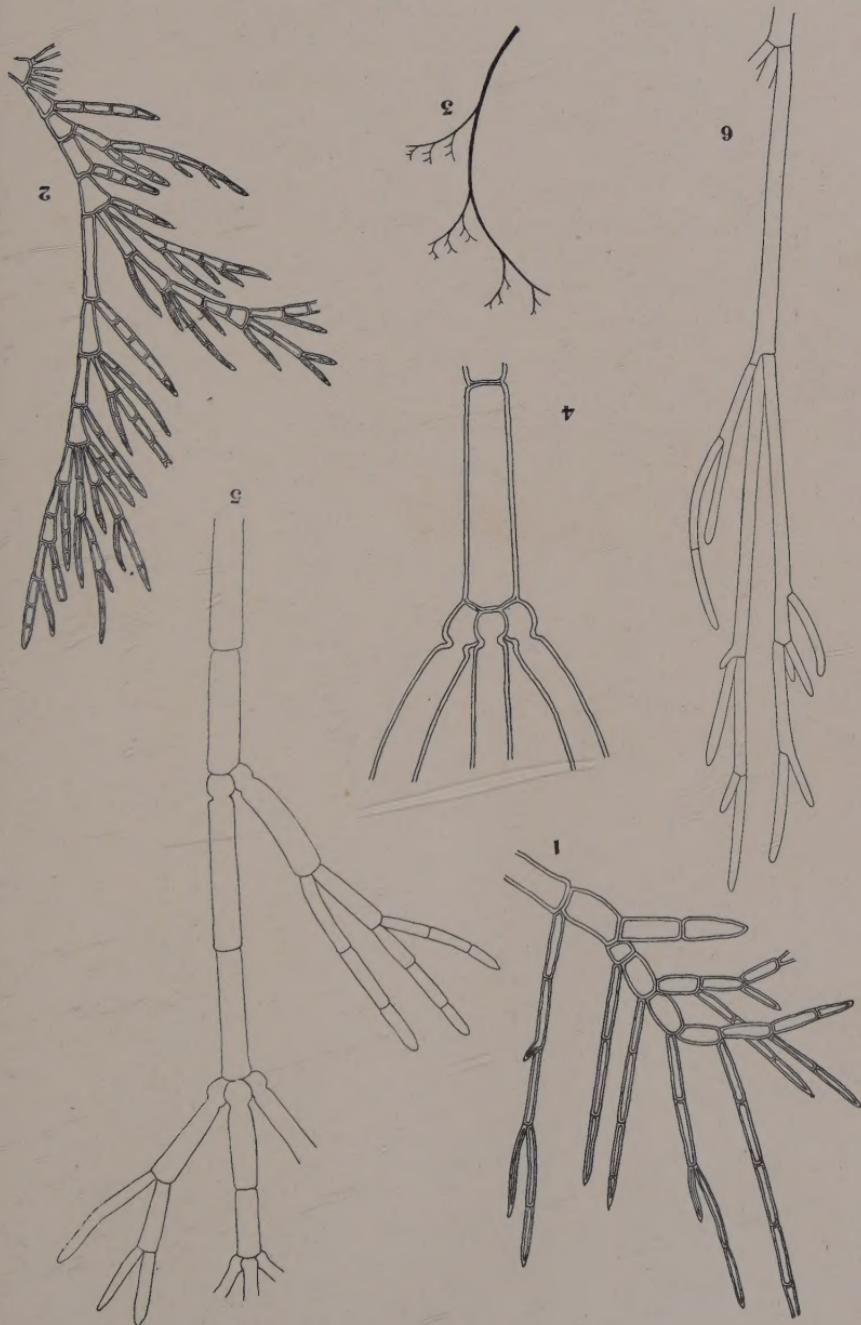
THE WEIGHT OF ICE-COVERED TWIGS.—On the morning of the 18th of January, 1909, the trees about Providence were covered with a thick coating of clear ice which resulted in the breaking of quite a number of branches, though not to the extent that one might have expected. The writer became interested in ascertaining the additional weight placed upon the smaller twigs by this icy coating. The figures obtained may be of interest to others who have never made accurate weighings under similar conditions. Several ice-incrusted twigs from each of three different plants were selected. Those from the Lilac and Apple were cut from unbroken branches. Those from the Elm were picked up from beneath the tree, although there were hundreds of unbroken twigs on the tree, just out of reach, having apparently even more ice on them.

The ice-covered twigs were weighed and after the ice had melted a second series of weighings were made of the surface-dried twigs. The results may briefly be enumerated as follows:—

The weight added to the Lilac, when compared with the surface dried twig, ranged from 244 to 757 per cent., except in one case where a large portion of the twig was found to have been dead and dried before the icy coating formed; in this case the percentage was 1330. The percentage of additional weight in the case of the Apple was from 633 to 983, and in the Elm from 1133 to 2470.—J. FRANKLIN COLLINS, Providence, Rhode Island.

Vol. 11, no. 121, including pages 1 to 16, was issued 13 February, 1909.

Figs. 1. Cladophora Howeii Figs. 4, 5. Cladophora constricta
 Figs. 2, 3. " Microcladoides Fig. 6. " Graminea
 Figs. S. Collected ad nat. det.



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